EXHIBIT 38

REDACTED

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA

UNITED STATES OF AMERICA, et al., Plaintiffs, v. GOOGLE LLC, Defendant.	Case No. 1:23-cv-00108-LMB-JFA

Expert Report of Judith A. Chevalier
January 23, 2024

concurrent introduction of UPR and UFPA was associated with a net output expansion and that AdX did not significantly displace sales made by competing exchanges. In sum, Prof. Simcoe's Event Study Approach does not show that AdX's revenue share was excessive.

17. In concluding that his Comparables Approach and Event Study Approach provide conservative estimates for but-for revenue shares, Prof. Simcoe inappropriately relies on a handful of speculative emails by select Google employees. None of those documents constitute an economic analysis, nor do they constitute a reasonable or reliable basis from which to infer a benchmark but-for revenue share for AdX.

18. In **Section V.B**, I describe how Prof Simcoe's apportionment approach does not produce a valid estimate of the degree to which any excessive AdX revenue shares translate into FAA harm. Prof. Simcoe's apportionment analysis is based on the assumptions that (1) the FAAs are representative advertisers and (2) the portion of any excess AdX revenue share borne by the FAAs is identical to that of the average advertiser. Inherent in Prof. Simcoe's apportionment analysis is an assumption that each of the FAAs faces identical demand and supply curves to the average AdX advertiser for the types of impressions it purchased. Relaxing this strong assumption reveals that, *if* there were any excess AdX revenue share, the portion of that excess revenue share borne by any individual advertiser would vary substantially across advertisers. Accounting for this variation implies that damages, if any, to some individual advertisers could be quite limited, or even *de minimis*. Furthermore, despite the presence of many other entities in the ad buying process (*e.g.,* agencies, ad-buying tools), Prof. Simcoe and Dr. Respess fail to consider the possibility that at least part, if not most or all, of the alleged AdX overcharge is absorbed by one or more parties other than the publisher or advertiser.

exchanges, it is completely unfounded for Prof. Simcoe to conclude that a lower revenue share is "predicted" by Google's CPM.[142]

65. Even if Prof. Simcoe were correct that an exchange with lower average CPMs was less preferred by publishers, CPM is a measure of the price paid by advertisers. All else equal, while, for a given impression, a lower CPM is less preferred by publishers, a lower CPM is better for advertisers and, an exchange with low-cost advertising opportunities will attract more advertisers. Further, Plaintiffs are seeking to recover damages on behalf of advertisers, namely the FAAs, not publishers. If it were indeed true that CPMs of impressions sold through AdX were lower than one would expect given its revenue share, this would, all else equal, benefit the FAAs.

66. Putting aside Prof. Simcoe's flawed logic, his conclusion that his empirical results demonstrate a "predicted" revenue share for AdX is also economically flawed. Prof. Simcoe's empirical model consists of a linear regression with only 7 observations.[143] A linear regression is a tool for statistical analysis widely used by economists and statisticians.[144] Generally, economists and statisticians use p-values to assess whether the relationships measured in a linear regression model are likely to simply be caused by chance rather than a reliable empirical relationship.[145] A p-value smaller than 0.100 typically implies that a relationship is statistically significant.[146] Prof. Simcoe reports p-values for other regressions in his report, but not for this one.[147] Based on Prof.

[142] Simcoe Report, ¶ 87.
[143] Simcoe Report, Figure 8.
[144] Wooldridge, Jeffrey, *Introductory Econometrics: A Modern Approach,* South-Western Cengage Learning, 2013 (5th Ed.), at p. 22.
[145] Wooldridge, Jeffrey, *Introductory Econometrics: A Modern Approach,* South-Western Cengage Learning, 2013 (5th Ed.), at pp. 133-135.
[146] Wooldridge, Jeffrey, *Introductory Econometrics: A Modern Approach*, South-Western Cengage Learning, 2013 (5th Ed.), at pp. 123-124, 133-135, 138.
[147] *See, e.g.*, Simcoe Report, Figure 16.

Simcoe's back-up data, I have calculated the p-value for this regression to be 0.375.[148] The p-value of 0.375 is much too high for the results of Prof. Simcoe's regression to be considered statistically significant. As such, this regression with a small number of observations and statistically insignificant results cannot be interpreted as demonstrating a positive relationship between exchange-level average CPM and revenue share, and thus cannot reliably be used to "predict" an appropriate but-for revenue share for AdX.

67. In addition to the flawed logic and weak results of Prof. Simcoe's regression exercise, the empirical results are also quite fragile to modest changes in data and assumptions. Specifically, Prof. Simcoe's conclusion that his empirical model "predicts" a 10 percent AdX revenue share is especially sensitive to his choice to use worldwide rather than U.S. impressions. Given that Plaintiffs seek damages on behalf of the FAAs, which largely focus their advertising on U.S. internet users,[149] the choice to focus on worldwide data exclusively is puzzling. Turning to U.S. data also allows the inclusion in the analysis of competing exchanges that reported only U.S. data rather than worldwide data in the discovery process. Applying Prof. Simcoe's Figure 8 methodology on U.S. data leads to Figure 9 below. In the figure, I show the regression line constructed identically to Prof. Simcoe's, but using 9 exchanges rather than 7 and using U.S. revenue shares and CPMs. I show the regression line both including and excluding Xandr to illustrate the importance of Xandr as an outlier in driving the results. The slope of the estimated relationship between CPM and average revenue share is cut in half simply by using U.S. rather than worldwide data. None of the estimated slope coefficients are statistically different from zero.

[148] Simcoe Report Workpapers, Comparables Scatter Plot.xlsx, at tab "comparables_bestfit.xlm." The p-value is calculated using a two-tailed t-test on the coefficient 0.0766, with standard error 0.0738 and 5 degrees of freedom. Wooldridge, Jeffrey, *Introductory Econometrics: A Modern Approach*, South-Western Cengage Learning, 2013 (5th Ed.), at pp. 134-135, 787.

[149] For example, I estimate that, collectively, during the damages period, more than 99.6% of FAA spending through DV360 was targeted at U.S. users. *See* Workpapers, "us_share_of_faa_spending.csv;" Appendix Exhibit 1.

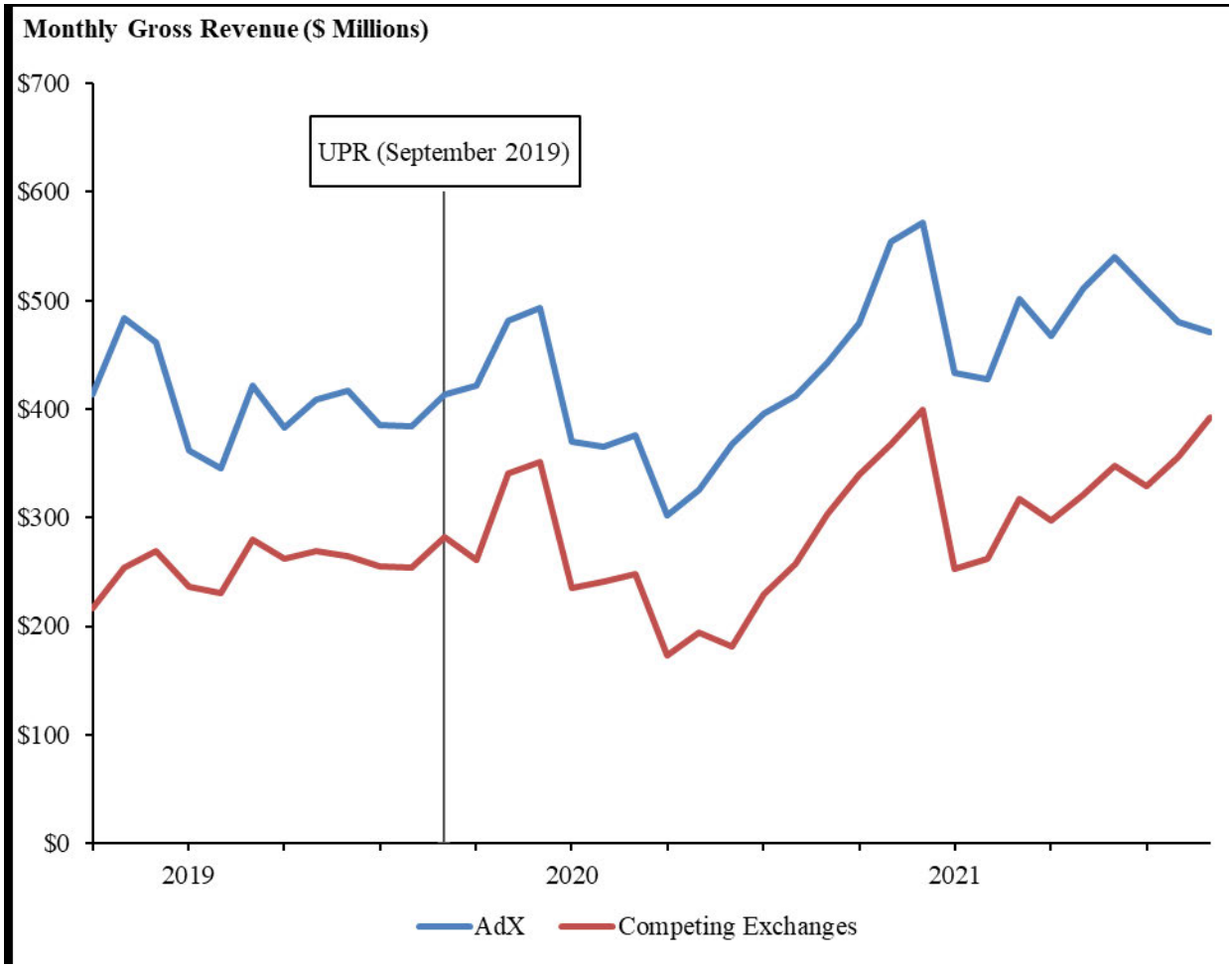
Figure 10. Worldwide Average Revenue Shares of Competing Exchanges Considered by Prof. Simcoe (Jan. 2019 – Mar. 2023)

Competing Exchanges	Revenue Share (%)
[redacted]	17.9%*
[redacted]	16.8%*
[redacted]	16.7%*
[redacted]	17.8%*
[redacted]	8.5%
[redacted]	17.2%*
[redacted]	32.6%*
All Competing Exchanges Weighted Average	16.2%

Notes & Sources: Asterisks denote exchanges with an average revenue share that is higher than the weighted average revenue share of 16.2%. Average revenue shares for each exchange are calculated based on worldwide transactions over the period from January 2019 – January 2023. Simcoe Report Workpapers are used to process and analyze exchange data. *See also* Exhibit 12.

76. Prof. Simcoe has not explained what enables these competitors to charge above-average revenue shares, and his methodology seemingly implies that these firms have overcharged advertisers through anticompetitive conduct—even though they have not been accused of such conduct. Alternatively, to the extent that these competitors were able to maintain their above-average revenue shares without engaging in allegedly anticompetitive conduct, Prof. Simcoe has not explained why AdX, too, could not also have charged above-average revenue shares for similar reasons. Prof. Simcoe's failure to provide these explanations invalidates his Comparables Approach. Prof. Simcoe has simply presumed that any AdX revenue share above the competitor average stems solely from the challenged conduct rather than determine the extent to which the challenged conduct caused some or all of the difference between AdX's revenue share and the average.

Figure 17. Worldwide AdX and Competing Exchanges Gross Revenue (Oct. 2018 – Sep. 2021)



Notes & Sources: Competing Exchanges include Index Exchange, Magnite, OpenX, PubMatic, Sovrn, Xandr, and Yieldmo. *See* Exhibit 18.

113. Figure 18 shows that the same patterns persist when revenues are calculated on a net (rather than gross) basis.

them, their spending, the prices of the impressions that their ad agencies purchase, their click-through rates, and their advertising strategies. These differences can be correlated with how sensitive the advertiser is to changes in price, which can affect the share of any overcharge borne by the advertiser. In fact, when Prof. Simcoe's method of estimating demand elasticities is modified to conduct the analysis on a more disaggregated basis, it shows that there is substantial heterogeneity in the degree to which advertisers respond to prices for the set of impressions they purchase.

138. Prof. Simcoe has neither analyzed nor accounted for the differences across advertisers in his apportionment analysis. Consequently, Prof. Simcoe's overcharge apportionment analysis does not provide a valid estimate of how much of any alleged AdX overcharge would be borne by *the individual FAAs*.

a) The FAAs Differ from the Average Advertiser and Among Themselves in Many Ways

139. The FAAs differ from the average advertiser, and differ among themselves, on a number of dimensions, such as the average AdX revenue share associated with their transactions, their ad spend, the CPM of the impressions that their ad agencies purchase, and their advertising strategies, among others.[319] As discussed above, the average AdX revenue share associated with the FAA transactions at issue (18.5 percent) is different from the average AdX revenue share associated with non-FAA transactions, even within the same industry. Dr. Respess's Figure 13 reports AdX's average revenue share from Google ad buying tools associated with advertisers from twelve distinct industry sectors. According to Dr. Respess, the average AdX revenue share for U.S. advertisers ranges from 18.1 percent (for Retail) to 20.5 percent (for Services), and the average

[319] In addition to the dimensions discussed below, the FAAs primarily target ads to reach U.S. users. For example, collectively, during the damages period, more than 99.6% of FAA spending through DV360 was targeted at U.S. users. *See* Workpapers, "us_share_of_faa_spending.csv."

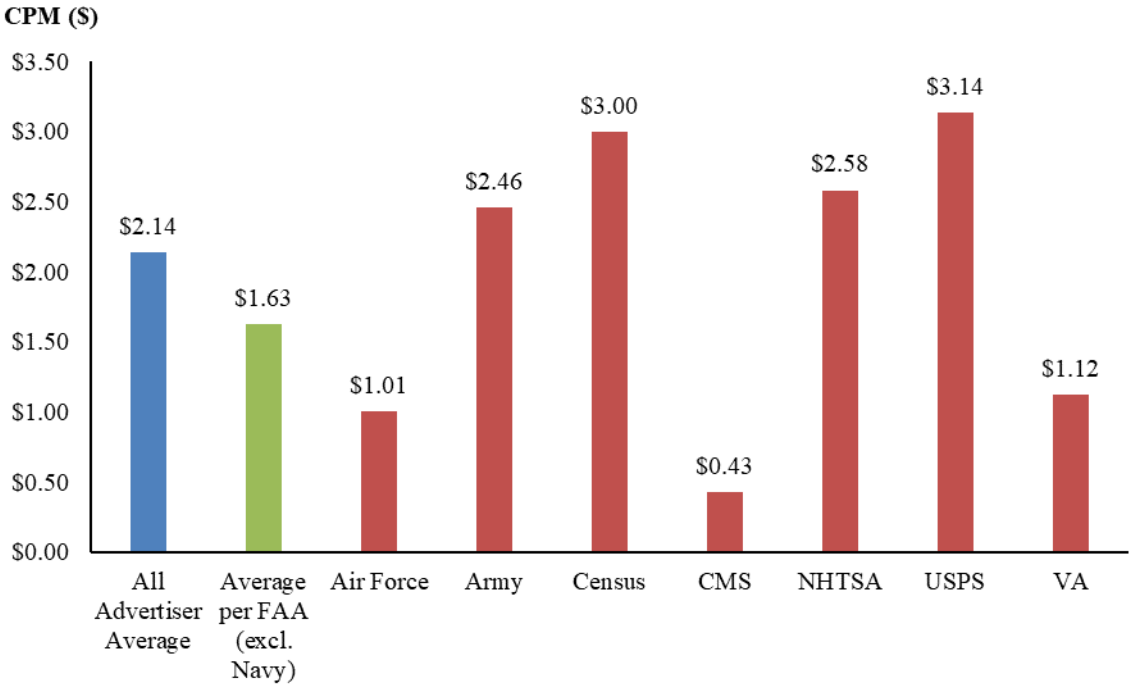
AdX revenue share for worldwide advertisers varies from 18.4 percent (for Retail) to 20.0 percent (for Services).[320] According to Dr. Respess, AdX's revenue share associated with the FAA transactions at issue (18.5 percent)[321] is less than the average AdX revenue share associated with all U.S. advertisers' transactions (19.1 percent) and that of all worldwide advertisers' transactions (19.2 percent).[322]

140. Further, Dr. Respess's Figure 16 shows that AdX's revenue share varies across the FAAs. According to Dr. Respess's calculations, the FAAs' average AdX revenue shares range from 17.3 percent (for CMS) to 19.5 percent (for the Census).[323] In addition, according to Dr. Respess's Figure 16, the total revenue share (buy- and sell-side combined) on the FAA transactions at issue that flow through DV360 ranges from 23.8 percent (for CMS) to 27.5 percent (for the VA), compared to the aggregate FAA total revenue share (24.6 percent) that Prof. Simcoe uses to estimate what he refers to as the Take Rate Semi-Elasticity of Impression Price.[324]

141. Google's buy-side data, together with Dr. Respess's calculations of the FAA spending at issue, show that the FAAs are among the larger advertisers in terms of DV360 spending.[325] On DV360, the spend on the FAAs' behalf considerably exceeds that of the average spending among U.S. advertisers using DV360.[326] As shown in Figure 22, each of the seven FAAs with DV360-to-AdX transactions at issue[327] individually spend substantially more than the

[320] Exhibit 24. Note that in this data, the VA's spending is entirely associated with "Healthcare" while all other FAAs' spending is entirely associated with "Education & Government."
[321] Respess Report, Figure 17; Respess Report Errata, Figure 17 (Corrected). Calculated as $7,720,993 / $41,789,429 = 18.5%.
[322] Exhibit 24. Calculated from Respess Report, Figure 13.
[323] Exhibit 25.
[324] Exhibit 25. Simcoe Report, ¶¶ 254-256, Figure 21, Figure 29. Note that according to Dr. Respess's Figure 16 (Respess Report Errata, Figure 16 (Corrected)), the total revenue share for all FAAs' DV360-to-AdX transactions combined is 25.3 percent, not 24.6 percent, as reported by Prof. Simcoe's Figure 29. *See* Exhibit 26.
[325] Note also, that Prof. Simcoe, too, refers to the FAAs as "large advertisers" albeit in more generic terms. *See* Simcoe Report, ¶ 127.
[326] Exhibit 26. For the purposes of my analyses in Figures 22-26, I use the field advertiser_parent_name to identify advertisers in the data.
[327] The exception is the Navy whose DV360-to-AdX transactions are not among the FAA transactions at issue.

Figure 24. Average CPM for All U.S. Advertisers and Federal Agency Advertisers, DV360-to-AdX (Jan. 2019 – Jan. 2023)



Notes & Sources: From Exhibit 29. CPM calculated as 1,000 × Advertiser Spending / Impressions. The Navy did not have spending at issue through DV360.

ranging from 0.00 to 17.31 using Prof. Simcoe's alternative price increase of 2.5 percent.[368] By contrast, Prof. Simcoe's simulation estimates a supply elasticity of 0.47 based on his preferred price increase of 6.18 percent.[369] Advertisers will differ in terms of which publishers they purchase inventory from. As such, accounting for differences among publishers, in addition to differences among advertisers, would likely lead to further dispersion in the range of potential advertiser overcharge shares applicable to any individual advertiser.

158. Prof. Simcoe does not conduct his apportionment analysis specifically for the FAAs; he simply assumes that the share of overcharge borne by each of the FAAs coincides with that of the average advertiser in his analysis. However, my analysis above reveals that there are material differences across advertisers, which can have a material impact on the share of any AdX overcharge borne by any specific set of advertisers, including the FAAs.

159. Prof. Simcoe points to elasticities derived from Google documents to claim that his estimates of demand elasticities are reasonable,[370] and that his estimates of supply elasticities are conservative.[371] However, these aggregate elasticity estimates are flawed in the same manner as the estimates that he derives from his simulation analysis—the aggregate elasticities are not advertiser-specific and do not inform the demand elasticity or supply elasticity relevant to an individual advertiser or the FAAs in particular.

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[368] *See* Exhibits 36, 40 and 43. Note that the median disaggregated publisher supply elasticity is substantially lower than the mean disaggregated publisher supply elasticity due to skew in the distribution of impressions sold. *See also* Exhibit 36, rows [11]-[15], which summarizes the distribution of disaggregated publisher supply elasticities associated with each of price increases Prof. Simcoe analyzes; all of these variants show substantial variation in the distribution of disaggregated publisher supply elasticities.

[369] Simcoe Report, ¶ 315, Figure 21. Using alternative price increases ranging from 2.50 to 10 percent, Prof. Simcoe's simulations result in estimates for the demand elasticity ranging from -2.81 to -1.57 and estimates for the supply elasticity ranging from 0.45 to 0.47.

[370] Simcoe Report, ¶ 246 ("The AdX demand elasticity estimates from my auction simulations, shown in the right panel of Figure 17, fall within the range spanned by the two estimates produced by treating Google's UPR experiments as a supply shock [shown in Figure 18]. I conclude that these two approaches to estimating the elasticity of demand produce consistent results.").

[371] Simcoe Report, ¶ 252; Simcoe Report Errata, ¶ 252 ("My simulation-based estimates of the AdX supply elasticity, shown in Figure 19, fall near the bottom of [the range shown in Figure 20].").

APPENDIX EXHIBIT 11

REPLICATION OF RESPESS APPENDIX D, FIGURE 35
USING ALTERNATIVE BUT-FOR TAKE RATES

	Census	CMS	Navy	NHTSA	Air Force	Army	USPS	VA	Total
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
[1] AdX Revenues	$1,079,785	$8,478,727	$237,307	$1,588,607	$4,758,948	$13,935,407	$6,734,684	$4,443,235	$41,256,699
[2] AdX Actual Take	$210,750	$1,500,431	$39,856	$288,417	$865,290	$2,642,574	$1,251,672	$822,580	$7,621,571
[3] Platform Fee	$91,772	$1,275,399	$38,631	$189,407	$400,869	$1,163,738	$572,447	$547,655	$4,279,919
[4] Platform Fees % of AdX Revenues	8.5%	15.0%	16.3%	11.9%	8.4%	8.4%	8.5%	12.3%	10.3%
With 10.0% AdX But-For Take Rate									
[5] AdX But-For Take	$107,979	$847,873	$23,731	$158,861	$475,895	$1,393,541	$673,468	$444,323	$4,125,670
[6] AdX Overcharge to FAAs	$19,637	$124,684	$3,081	$24,754	$74,402	$238,653	$110,477	$72,273	$667,962
[7] Platform Fee Overcharge	$1,669	$18,755	$502	$2,951	$6,267	$19,930	$9,391	$8,908	$68,373
With 16.2% AdX But-For Take Rate									
[8] AdX But-For Take	$174,925	$1,373,554	$38,444	$257,354	$770,950	$2,257,536	$1,091,019	$719,804	$6,683,585
[9] AdX Overcharge to FAAs	$6,845	$24,242	$270	$5,935	$18,026	$73,569	$30,696	$19,637	$179,221
[10] Platform Fee Overcharge	$582	$3,647	$44	$708	$1,518	$6,144	$2,609	$2,420	$17,672
With 16.6% AdX But-For Take Rate									
[11] AdX But-For Take	$179,244	$1,407,469	$39,393	$263,709	$789,985	$2,313,278	$1,117,957	$737,577	$6,848,612
[12] AdX Overcharge to FAAs	$6,020	$17,762	$89	$4,721	$14,388	$62,919	$25,549	$16,242	$147,689
[13] Platform Fee Overcharge	$512	$2,672	$14	$563	$1,212	$5,254	$2,172	$2,002	$14,401
With 17.0% AdX But-For Take Rate									
[14] AdX But-For Take	$183,564	$1,441,384	$40,342	$270,063	$809,021	$2,369,019	$1,144,896	$755,350	$7,013,639
[15] AdX Overcharge to FAAs	$5,195	$11,282	($93)	$3,507	$10,751	$52,268	$20,402	$12,846	$116,158
[16] Platform Fee Overcharge	$441	$1,697	($15)	$418	$906	$4,365	$1,734	$1,583	$11,130
With 17.3% AdX But-For Take Rate									
[17] AdX But-For Take	$186,803	$1,466,820	$41,054	$274,829	$823,298	$2,410,825	$1,165,100	$768,680	$7,137,409
[18] AdX Overcharge to FAAs	$4,576	$6,422	($229)	$2,596	$8,023	$44,280	$16,541	$10,299	$92,509
[19] Platform Fee Overcharge	$389	$966	($37)	$310	$676	$3,698	$1,406	$1,269	$8,676

APPENDIX EXHIBIT 11

REPLICATION OF RESPESS APPENDIX D, FIGURE 35 USING ALTERNATIVE BUT-FOR TAKE RATES

Notes & Sources:

This Appendix Exhibit is based on Respess Report Errata, Appendix D, Figure 37. Rows [1]-[13] mimic the calculations found on Respess Report Errata, Appendix D, Figure 37 and Repess Backup 'Figures 13-19, Appendix D.xlsx' at sheet 'Figure 37.' I note that row [2] and the AdX But-For Takes are not visible on Respess Report Errata, Figure 37, but are hidden and used as inputs in Dr. Respess's backup excel file.

[1]-[4] From Respess Report Errata, Appendix D, Figure 37 and Respess Backup 'Figures 13-19, Appendix D.xlsx', at sheet 'Figure 37.'

[5] = [1] × 10.0% But-For Take Rate.

[6] = ([2] - [5]) × 99.0% × 19.3%. See Respess Report Errata Backup 'Figures 13-19, Appendix D.xlsx' at sheet 'Figure 37.'

[7] = [6] × [4].

[8] = [1] × 16.2% But-For Take Rate.

[9] = ([2] - [8]) × 99.0% × 19.3%. See Respess Report Errata Backup 'Figures 13-19, Appendix D.xlsx' at sheet 'Figure 37.'

[10] = [9] × [4].

[11] = [1] × 16.6% But-For Take Rate.

[12] = ([2] - [11]) × 99.0% × 19.3%. See Respess Report Errata Backup 'Figures 13-19, Appendix D.xlsx' at sheet 'Figure 37.'

[13] = [12] × [4].

[14] = [1] × 17.0% But-For Take Rate. 17.0% But-For Take Rate from Simcoe Report, Figure 28.

[15] = ([2] - [14]) × 99.0% × 19.3%. See Respess Report Errata Backup 'Figures 13-19, Appendix D.xlsx' at sheet 'Figure 37.'

[16] = [15] × [4].

[17] = [1] × 17.3% But-For Take Rate. 17.3% But-For Take Rate from Simcoe Report, Figure 28.

[18] = ([2] - [17]) × 99.0% × 19.3%. See Respess Report Errata Backup 'Figures 13-19, Appendix D.xlsx' at sheet 'Figure 37.'

[19] = [18] × [4].

[I] = Sum of [A]:[H], except [1]-[4], which are directly from Respess Report Errata, Appendix D, Figure 37 and Respess Backup 'Figures 13-19, Appendix D.xlsx' at sheet 'Figure 37.'